

The Claims

What is claimed is:

5 1. A process for conditioning a compressor airflow in an axial
compressor comprising an entrance, an exit, a central rotor and a stator surrounding the
rotor, with the rotor and stator being coaxially arranged about an axis, in which process
the airflow is drawn in at the entrance and compressed along the axis, wherein the drawn
in airflow comprises a main flow and a boundary flow lying at an inner wall of the stator,
10 wherein air is taken from the boundary flow at an outlet lying before the exit in flow
direction for use as cooling air, and wherein between the entrance and the outlet water is
introduced into the boundary flow and evaporates while cooling the boundary flow.

 2. The process of claim 1, wherein the water is introduced into the
15 axial compressor so that the water forms a thin water film on the inner wall of the stator.

 3. The process of claim 2, wherein the water is sprayed into the
boundary flow by a plurality of nozzles arranged proximate the circumference of the
stator.

20 4. A process for conditioning a compressor airflow in an axial
compressor comprising an entrance, an exit, a central rotor and a stator surrounding the
rotor, with the rotor and stator being coaxially arranged about an axis, the process
comprising:
25 drawing and compressing the airflow from the entrance toward the exit,
the airflow comprising a main flow and a boundary flow disposed at an inner wall of the
stator;
 introducing water into the boundary flow and evaporating the water while
cooling the boundary flow;
30 directing air from the cooled boundary flow out an outlet disposed
between the entrance and exit for use as cooling air.

5. The process of claim 4, wherein the water is introduced into the axial compressor so that the water forms a thin film on the inner wall of the stator.
6. The process of claim 5, wherein the water is sprayed into the boundary flow by a plurality of nozzles arranged proximate the circumference of the stator.
7. The process of claim 4, wherein the axial compressor further comprises an alternating arrangement of running blades and guide vanes, and the water is introduced through nozzles disposed between adjacent running blades and guide vanes.
8. The process of claim 7, wherein the nozzles are arranged proximate the entrance of the axial compressor in flow direction.
9. An axial compressor adapted to condition an airflow, the axial compressor comprising:
an entrance, an exit, a central rotor and a stator surrounding the rotor, with the rotor and stator being coaxially arranged about an axis;
means provided on the stator for introducing water into a boundary flow of the airflow disposed at an inner wall of the stator.
10. The axial compressor of claim 9, wherein the means for introducing water comprises a plurality of nozzles circumferentially arranged on the stator.
11. The axial compressor of claim 10, wherein the axial compressor further comprises an alternating arrangement of running blades and guide vanes, and the nozzles are mounted between adjacent running blades and guide vanes.
12. The axial compressor of claim 11, wherein the nozzles are arranged proximate the entrance of the axial compressor in flow direction.

13. The axial compressor of claim 10, wherein the nozzles are arranged proximate the entrance of the axial compressor in flow direction.

14. The axial compressor of claim 10, further comprising an outlet
5 disposed between the nozzles and exit for receiving air from the boundary flow.